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# **Science & Technology**

***USSR: Computers***

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# Science & Technology

## USSR: Computers

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UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY, November-December 1988**

**Principles of Logical-Time Processor Design**

18630186a Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 3-7

[Synopsis of article by V. P. Kozhemjako, A. G. Kirienko, and Ju. A. Storozhuk]

[Text] Problems related to the design of new type logical-time processors are treated. Principles of logical-time data representation, parallel processing, and minimax decision making are suggested. Optoelectronic hardware is discussed. Algorithms and processor structures are described in connection with specific fields of applications and according to the given classification of tasks and objectives of image processing.

**Theoretical and Practical Problems of  
Multicomputer Organization of High-Reliability  
SM Computer Systems**

18630186b Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 8-13

[Synopsis of article by S. V. Peselev]

[Text] Ways of ensuring the maximum levels of reliability of redundant and recoverable SM computer systems are studied. Radically new models of reliability of computer systems as complicated informatics systems are analyzed. The models incorporate kinds of malfunctions, the multiprogram nature, changes in priority structure when one call is being handled, impact of errors on the information process stability. Relations between parameters resulting in transformation of malfunctions into failures are defined. Practical aspects of construction of high-reliability computer systems are discussed.

**Analog Storage Element Circuit Oriented Towards  
Solid-State Construction**

18630186c Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 14-16

[Synopsis of article by A. D. Bekh, V. V. Cherneckiy, S. P. Sergeev, A. P. Ganin, and V. I. Degtjaruk]

[Text] The design principle and characteristics of available storage elements are discussed. Dependences of the high speed and precision of elements on the parameters and modes of operation are analyzed. The authors consider and describe a version of a circuit of the analog storage element based on a charge-accumulating amplifier and suited to construction by the solid-state technology. Methods of attaining the high precision of such elements are indicated.

**Programmed Generators of Test Sequences for  
Systems of Digital Equipment Check and  
Diagnostics**

18630186d Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 17-23

[Synopsis of article by O. V. Buzovskij, Ju. S. Vilinskij, and A. A. Nakonechnyj]

[Text] Hardware-software structures of programmed test sequence generators used in computer-aided check systems are dealt with. A number of hardware complexity estimates are obtained for different kinds of generators. Construction of several generator units are exemplified. Recommendations with respect to their application in generation of suitable test sequences oriented towards testing the subjects of the check with a memory and an organized bus are offered.

**Software Support of System "Lingvist 802" for  
Testing Digital Devices**

18630186e Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 24-26

[Synopsis of article by V. I. Borshchevich, V. D. Zhdanov, G. K. Bodjan, E. V. Morshchinin and V. V. Sidorenko]

[Text] A software support (SS) of the experimental system "Lingvist 802" intended for stochastic check of complicated, specifically microprocessor, devices is considered. SS operates in the OS DVK-2 environment and provides a means for programming the control algorithms of stochastic generation of test programs, for translating them into the system of machine instructions of the microcomputer DVK-2 and the hardware of check systems.

**Facilities Designed to Organize Interaction  
between Application Processes in EC  
Computer-Based Systems**

18630186f Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 27-33

[Synopsis of article by S. V. Nazarov, A. I. Kvasov, S. V. Makeev, and O. L. Kotov]

[Text] Specific versions of software facilities are offered for organizing interaction between applications within multimachine computing systems based on the EC computers. These facilities permit organizing interpartition data exchange between application processes on one computer as well as data exchange between application processes on adjacent computers through a direct control interface and a "channel-to-channel" adapter. Characteristics of the designed facilities and their capacities are given.

**Problems of Design of Functionally Oriented Services in EC Computer Networks**

18630186g Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 34-39

[Synopsis of article by S. B. Kavickij]

[Text] The state-of-the-art in development of functionally oriented services in EC computer networks is discussed. A concept of construction of the functionally oriented services of file transfer, virtual file is put forth. The concept depends on a unified architecture and is based on a universal protocol of interaction between application processes at the presentation level. Main principles of implementation of a special port in such a network as a part of the virtual telecommunication access method are studied.

**Data Teleprocessing Subsystem Based on PTD-3M Processor. Choice of Reliability Indices**  
18630186h Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 40-42

[Synopsis of article by D. V. Avdeev, L. I. Kul'bak, and N. N. Paramonov]

[Text] The choice of reliability indices for a data teleprocessing subsystem based on the PTD-3M processor is grounded on efficiency of the subsystem operation and on salient features of its structure.

**Some Problems of Computing Organization in Interactive Multiaccess Decision Making Systems**  
18630186i Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 42-47

[Synopsis of article by A. N. Koldyrkaev]

[Text] Problems concerning the organization of software for interactive systems of decision making in multiaccess mode are treated. The standard architecture is suggested for the software organizing and supporting computations in the system of this type. The architecture is founded on the principle of centralized control of separate interactive processes and their associated sequential elementary processes representing stages in handling the interactive processes.

**Analysis of Ways of Improving Integrated Software Debugging and MIS Operator Activity**  
18630186j Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 48-51

[Synopsis of article by L. B. Goroshchenko]

[Text] Ways of improving the integrated software debugging and test processes are examined together with methods of computer-aided assessment of functional fitness and quality of training of MIS operators.

**Organization of Interaction between Operator and Computer System MIKROS**

18630186k Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 51-54

[Synopsis of article by V. V. Korneev and Ju. N. Potapova]

[Text] An interpreter of instruction language of a remote console terminal realized within the framework of the distributed decentralized operating system MIKROS is described. It enables the operator of any computer to access resources of remote computers in a multimachine computing system. The adopted mechanism of operator-system interaction can be used for mutual control of processes taking place in the system.

**Methods of Programming Skills Training in School Informatics**

18630186l Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 54-60

[Synopsis of article by V. B. Doronin and T. N. Rylova]

[Text] Described are methods of an active and differentiated study of school informatics from the unified position of technological approach to the computer-aided solution of education and professional problems. Basic definitions and principles of the technological approach are stated. Objectives and contents of the training are differentiated with respect to categories of pupils on the basis of finding of psychologic-didactic parameters introduced by the authors. All components of the training process and computerized training facilities supporting it are examined from the standpoint of general approach to the construction of interactive graphic programming systems. Experience in application of the technological approach in specific conditions is described.

**Elaboration of Engineering-Economic Data Classifiers as Element of Conceptual Data Base Design**

18630186m Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 61-60 [sic]

[Synopsis of article by S. D. Mikhnovskij and G. M. Popov]

[Text] The elaboration of engineering-economic data classifiers is studied in its inexorable association with the design of data for computer-aided systems, more precisely, as a stage in the conceptual modeling of an enterprise. It is demonstrated that the classification and coding system is an essential part of a data model. Operations on classifiers minimizing the number of applied classifiers in the design of computer-aided systems are described.



### **Tubular Data Types**

18630186n Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 65-69

[Synopsis of article by Ja. M. Rumjancev and Ju. N. Onopchuk]

[Text] An informal typification of tabular data is offered. It relies on structures dealt with in real practice. In addition to the common operations of data maintenance a system of operations specified in the form of tabular, aggregate operations, and columns of formulas is suggested. Thus, the possibility of mapping computations into a data organization model is demonstrated.

### **Software Facilities Making for External Storage Redundancy**

18630186o Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 70-72

[Synopsis of article by R. R. Fajzullina]

[Text] Described is an implementation of software facilities boosting reliability of magnetic disk and tape storage and designed for the OS RV running on the SM computer complexes. The reliability boost is achieved through the concurrent operation with several identical copies of the media.

### **Structure and Principles of Operation of Network Administrator of Distributed Data Base of Computer-Aided Data Processing System of Academy of Science of Azerbaijan SSR**

18630186p Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 72-724

[Synopsis of article by A. M. Abbasov and L. Z. Briskin]

[Text] Described are a structure of a distributed data base of the computer-aided data processing system of the Academy of Sciences of the Azerbaijan SSR and functions of a network administrator of the data base. Interaction between program modules of the network administrator is shown.

### **Design Process Description Language**

18630186q Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 74-77

[Synopsis of article by S. V. Bondarev and S. Ju. Chepurunov]

[Text] The authors discuss the possibility of automating the passage of tasks from one to another stage of processing in a CAD system. The existing batch processing facilities are analyzed. Causes of their inefficiency in CAD systems are revealed. A design process model having the form of weighted directed graph and a model description language are suggested as well as their program realization based on a task autostart monitor in the CAD system.

### **Fundamentals of Dialog Integrated CAD Systems Construction**

18630186r Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 77-80

[Synopsis of article by V. A. Visikirskij, S. B. Dodonov, and A. B. Pokhvalinskiy]

[Text] Architecture of an integrated CAD system is dealt with. Its kernel consists of a control processor, language processors, a graph data model, data base and knowledge base control systems, basic graphics packages. The authors treat of kernel-based application program packages: that of transformation of a draft into a drawing and that of 3-D geometric modeling.

### **Structure of Set of Problems Solved by Multilevel Computer-Aided Research System of General Physics Profile**

18630186s Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 80-85

[Synopsis of article by V. N. Starkov]

[Text] Fundamentals of the design of a three-level computer-aided system of research of general physics profile are set forth. Objectives of the construction of an institute-wide computer-aided system of research of general physics profile are formulated, the system structure is defined. Described is a composition of subsystems comprising workstations for experimentators, computerized problem-oriented laboratories, and multicomputer complexes.

### **Check of Computerized Industrial Installations by Frequency Methods**

18630186t Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 85-89

[Synopsis of article by M. A. Luchuk, V. V. Masliev, V. V. Ruchko, and Ju. G. Savchenko]

[Text] Suggested is a method of functional check of complex computerized industrial installations that relies on the statistical model of installation functioning as a frequency allocation of output sequence segments.

### **Archive Aerospace Data Retrieval System for Remote Explorations**

18630186u Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian Nov-Dec 88 pp 90-91

[Synopsis of article by Ju. V. Chukin]

[Text] There is described an aerospace data and materials retrieval system designed to keep, store, and retrieve data about materials of aerospace photography at video-data processing centers. The system is implemented in the OS RV environment on the control computer complex SM-4 equipped with a standard set of external devices. Its data base consists of three files: the space

photographs, aerial photographs, and space photomaps. The system enables a retrieval of data by a set of attributes and conditions, display of located photographs, yielding of secondary data sources.

**Construction of Heterogeneous Local Computer Network for FMS**

18630186v Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 92-95

[Synopsis of article by N. P. Starodub, A. I. Slobodjanjuk, and S. D. Pogorelyj]

[Text] Described is a structure and software of a heterogeneous local computer network including the mini-computer SOU-2. Block-diagram of the heterogeneous local computer network hardware is depicted. The article is of practical value.

**Language Facilities for Advanced Electroautomatics Control Design**

18630186w Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 95-100

[Synopsis of article by V. L. Sosonkin and L. E. Shergin]

[Text] Tools of software design for advanced electroautomatics of complex machines with single-processor N/C devices are described. The original problem-oriented real-time language FOKON, displaying facilities, and program debugging means underlie these tools.

**Automation of Decision Making Aimed at Neutralization of Effects of Non-Standard Situations in FMS**

18630186x Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 100-103

[Synopsis of article by N. V. Globa]

[Text] A computer-assisted decision making system aimed at the neutralization of effects of non-standard situations in flexible manufacturing systems (CADMS FMS) is described. Employment of semantic networks to store and use data about FMS operation is discussed. An integrated index of FMS efficiency and a global criterion of optimization in problems of decision making in FMS are introduced. The CADMS FMS structure and principles of its operation are examined.

**Industrial Computer Network—Systems Engineering and Technology Basis of Integrated Automated Management Systems**

18630186y Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 104-105

[Synopsis of article by A. A. Morosov, Z. M. Asel'derov, V. I. V'jun, and A. A. Kuprijanov]

[Text] Software-hardware aspects of construction of industrial computer networks of IAMS for large machine building plants are considered. General requirements for such network and its components, principles of network software, its architecture and composition are presented. Functional characteristics of the network software are given in comparison with levels of a standard model of open systems of the International Organization for Standardization. A realization of the industrial computer network of a large machine building plant is considered.

**Basic Hardware-Software Facilities of Local Information Network**

18630186z Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 107-108

[Synopsis of article by E. P. Moiseenko and G. I. Sinjaev]

[Text] A concept of construction of a heterogeneous monochannel local network using computers of the EC and SM type is offered. Main technical data of an operating network, a structure and functions of network protocols are given.

**Network Software of Heterogeneous Computer Network**

18630186aa Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian Nov-Dec 88 pp 109-112

[Synopsis of article by Z. M. Asel'derov and V. G. Pilipenko]

[Text] Described is a communications process monitor (CMP), i.e., a program part of a transport service in a production computer network and a base means for interaction between processes in the production computer network. Formulated are major requirements for the process interaction to be successful. The transport interface instruction set and rules of logical instruction exchange are given. Circuits opening and closing ports and receiving and transmitting data through these ports are examined. Procedures of routing and data array integration-disintegration applied in the network are considered.



**Software Implementation of Communications  
Monitor of Processes in Production Computer  
Network**

18630186ab Kiev UPRAVLYAYUSHCHIYE SISTEMY  
I MASHINY in Russian Nov-Dec 88 pp 112-116

[Synopsis of article by V. I. Solovej, S. B. Mikha-  
levich, and A. M. Prostakov]

[Text] Described is a software realizing the transport  
service in the network and expanding the application of  
operating systems of series computers in heterogeneous  
computer networks.

**Development and Results of Investigation of File  
Transfer System**

18630186ac Kiev UPRAVLYAYUSHCHIYE SISTEMY  
I MASHINY in Russian Nov-Dec 88 pp 116-118

[Synopsis of article by A. A. Kuprijanov]

[Text] An implementation of a file protocol of an indus-  
trial computer network (ICN) is examined. The ICN  
data communication system is based on communication  
channels of various capacity. The file protocol is realized  
in OS EC and OS RV as a system of file transfer (SFT)  
between network nodes with the help of transport ser-  
vice. Functional capabilities of SFT are described. A  
protocol model is given.

**Synopses of Articles in  
UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY, No 3, May-June 1989**

**Strategy of Development of Computers and  
Networks From a Position of Economic Interest of  
Their Owners**

18630211a Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian No 3, May-Jun 89 pp 3-11

[Synopsis of article by E. I. Brjukhovich]

[Text] Differentiated concepts of time saving factors in  
the process of information generation in computer sys-  
tems are introduced. An attempt to form a strategy of  
computer system development is made. This strategy  
rests on the selective action of these factors and is aimed  
at all possible intensification of the turn-over as a single  
process in computer systems and networks. The sug-  
gested strategy represents the objective, natural course of  
the development of computer engineering. A system of  
economic indices for estimation of the efficiency of the  
activity of a main production link and an integral  
economic system in the sphere of information industry is  
given.

**Trace in Debugging of Multimicroprocessor  
Systems**

18630211b Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian No 3, May-Jun 89 pp 12-15

[Synopsis of article by A. V. Palagin, V. I. Sigalov, and O.  
V. Cvelodub]

[Text] A method is suggested for tracing the operation of  
multiprocessor system. It permits of the restoration of a  
sequence of interactions between system microproces-  
sors. Ways of extension of the length of translated  
section of the program being debugged are considered. A  
device implementing the suggested method is described.

**Mathematical Model of Condensate Precipitation  
in Ion-Plasma Spraying**

18630211c Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian No 3, May-Jun 89 pp 16-17

[Synopsis of article by A. A. Snegur, S. N. Borisov, S. Ju.  
Mazyra, A. I. Rybka]

[Text] Mathematical models of time variations in a  
condensate surface area and in reflection coefficient of a  
"condensate-wafer" system are elaborated. These mod-  
els are at the root of an algorithm, designed for process-  
ing signals of photometric sensor of the spraying process.  
The algorithm makes it possible to check the degree to  
which the wafer is filled with the condensate. It is of  
great importance in the manufacture of multilayer wear-  
resistant coatings with a minimal thickness of films in  
the layers. The mathematical model and the algorithm  
for processing the signal of process sensor are meant for  
a vacuum spraying control system.

**Operational Models and Planning of Parallel  
Computations in Real-Time Multiprocessor  
System**

18630211d Kiev UPRAVLYAYUSHCHIYE SISTEMY I  
MASHINY in Russian No 3, May-Jun 89, pp 18-22

[Synopsis of article by A. G. Jarusov]

[Text] Principles of operational interaction of programs  
in a multiprocessor system are described. Operational  
models of sequential programs and parallel packages are  
given. Organization of planning of computational pro-  
cesses in the real-time system is shown on concrete  
examples with the help of the language of operational  
models of parallel programs.

**Methods of Analysis and Synthesis of Physical Structure of Special-Purpose Information-Computer Networks**

18630211e Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89, pp 22-27

[Synopsis of article by E. I. Makharev, G. F. Janbykh]

[Text] Statement of the general problem of synthesis of physical structure of industrial and regional information and computer networks is described. Suggested is a hierarchical set of models of analysis and synthesis of separate components of the network; zonal subscribers' communication networks. Results of the use of the described methodology at the Ministry of Civil Aviation of the USSR are given.

**Homogeneous Environment for Organizing Interaction Between Processes in Heterogeneous Computer System**

18630211f Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 27-31

[Synopsis of article by M. I. Rabinovich and Ju. I. Chernyy]

[Text] A problem of creating a homogeneous environment for operation of real-time system software in distributed loosely coupled heterogeneous computer systems (DSC) is dealt with. There is described a program package providing a virtual homogeneous environment in DCS. It permits interaction between processes with the problem-oriented system-independent addressing.

**Implementation of Parallel Control in Local Systems of Non-Standard Equipment Control**

18630211g Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 31-35

[Synopsis of article by V. V. Golicyn, V. A. Subbotin]

[Text] The authors offer an original modification of the simplest dispatching method based on the principle of process service circulation. An operating system kernel is described. Recommendations with respect to the use of the operating system in local systems of non-standard equipment control are formulated.

**On Constructing Distributed Database Management Systems in Mini- and Microcomputer Environment**

18630211h Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 35-38

[Synopsis of article by A. I. Maljerenko]

[Text] Experience in the design of a distributed database management system in the environment of minicomputers compatible with SM-4 and microcomputers compatible with "Elektronika-60" is considered. OS RAFOS-2

is chosen as the operating system. The network-structured database management system MIKRO-SETOR serves as the basis of the study.

**Standard R-Technology of Programming, Principal Design Decisions**

18630211i Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 40-44

[Synopsis of article by O. V. Malyshev, I. E. Shchetinin]

[Text] The development of standard programming technologies is the most urgent problem of the modern commercial programming. Described are principal design decisions implemented in the standard R-technology of programming and determining its most essential properties, that is, the structure, components of systems designed with its help, the structure of these components and their interrelations, main design stages and their characteristics.

**Employment of Principles of R-Technology in Programming Logical Controllers**

18630211j Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 44-48

[Synopsis of article by I. A. Furman, A. V. Volovich]

[Text] Described are methods of employing the principles of the R-technology when programming logical controllers of two classes: the sequential controlled by an instruction flow, and the parallel, controlled by an input state flow. Possibilities of using the R-technology in computer-aided programming of logical controllers are shown.

**Software Design for CAD Systems**

18630211k Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 48-52

[Synopsis of article by A. V. Rybakov]

[Text] The author demonstrates the practicability of commercial CAD software design by experts in an enterprise using specification languages. Translations of description from the specification language to the operating software is performed automatically by appropriate tools.

**Generation of Minimal Set of Test Data by Block Diagrams**

18630211l Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89, pp 52-56

[Synopsis of article by Ja. Ja. Tepandi]

[Text] A method is suggested for generating a maximal required volume of data by specifications. The specifications are the block diagrams for input and output program data. The test data volume depends on the mode of test data generation, available user's resources,

and other parameters. The parameters are defined by the user or by an expert system. This method is implemented in the programmer's assistant in testing TESTER.

### **Problem-Oriented Comprehensive Testing of Real-Time Programs**

18630211m Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89, pp 56-61

[Synopsis of article by V. M. Khejfec, B. A. Pozin]

[Text] A method and facilities of computerization of a comprehensive dynamic testing of real-time programs are offered. Their application makes it possible to form primary standards of tests in terms of and dependent on the MIS documentation, to check automatically the test execution by event scheme and to analyze test results. Analysis overheads are reduced by a factor of  $10^2$  to  $10^3$ .

### **Design of Expert System for Development of Machines, Equipment, and Technological Processes**

18630211n Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 63-68

[Synopsis of article by E. D. Solozhencev]

[Text] Described are the technology, documents, models, forms of representation, and mechanisms of refinement of knowledge as well as base software facilities of a problem-oriented expert envelope for development of complex machine-building plants.

### **Expert System as a Means of Support of Development Efforts**

18630211o Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 68-73

[Synopsis of article by A. A. Prikhozhiy, A. A. Tolkachev]

[Text] Problems of the design of an expert system to support development efforts relying on knowledge bases are considered. Methods of representation of engineering knowledge, technology of problem solving, the process of design in the expert system are set forth. The possibilities of using the expert system in the exploratory design and in the choice of the way of casting when designing the parts are shown.

### **Frame Tools for Interaction Design**

18630211p Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 73-77

[Synopsis of article by N. L. Chekotilo]

[Text] Tools are offered for the design of application interactive systems with artificial intelligence elements. These tools comprise an apparatus for generating interaction scenarios based on active frame networks and a non-standard procedure repertoire, i.e., operations of the

algebra of frames from which application modules of knowledge processing are constructed. The frame system of interaction design operates in the environment of LISP extension tools.

### **Automated Correction of Operator Errors Using Dictionary Standard**

18630211q Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 77-80

[Synopsis of article by I. V. Dremov, V. A. Litvinov]

[Text] A method of automated correction of operator errors using a dictionary standard is treated. A general scheme of check-correction is described. Probability characteristics of this method are studied. Methods of dictionary standard processing are analyzed, their laboriousness is estimated.

### **Theoretical Foundations of Methodology of Organization of Information Monitor for Automated System of Geometry and Graphics**

18630211r Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 81-85

[Synopsis of article by V. A. Osipov, S. A. Sinicyn]

[Text] Discussed are problems of organization of an automated system of geometry and graphics (ASIG) as an independent system invariant with respect to distinguishing features of a branch in the production and higher education spheres at the basis of which the problems of automation of geometrical computations and computer graphics are solved. Examples of solution of practical problems of optimization of geometrical modeling and initial data for geometrical computations are given.

### **Semantic Processing of Drawings**

18630211s Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 85-89

[Synopsis of article by A. V. Kizub]

[Text] A new approach to the coding and editing of graphic data on the basis of a really used designer's grid RISK is described. RISK enables one to get exact drawings from a draft. The distinctive characteristic of the RISK is the use, at the system input and output, of graphics exclusively with its similar understanding by the designer and computer.

**Set of CAD Invariant Tool Subsystems and Its Application to Computerize Finite-Element Analysis of Three-Dimensional Constructs**

18630211t Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89, pp 90-93

[Synopsis of article by G. V. Isakhanov, A. L. Sinjavskij, O. A. Kholodenko, V. I. Tartachnik]

[Text] A set of CAD invariant tool subsystems is described. It is developed at the Task Research Laboratory of thin wall constructs of the Kiev Civil Engineering Institute. The composition and structure of this set were inferred first of all from the requirements of computerization of the strength analysis performed by the finite element method. Some elements of the set are successfully used in other fields too.

**Expert Estimate Construction in Choosing Alternate Computer Design Algorithms by Pattern Recognition Methods**

18630211u Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 94-97

[Synopsis of article by S. A. Arustamov, A. L. Kutsnecpv. S. Ju. Jakovleva]

[Text] Possibilities of pattern recognition in developing CAD of hardware units (printed boards, microassemblies, matrix large-scale integrated circuits) are studied. Principles of organization of an expert structure, methods of learning the optimal design by the expert control structure, experiment results are set forth.

**Special-Purpose System POLE-SM for Simulation of Various Physico-Mechanical Fields**

18630211v Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 97-99

[Synopsis of article by V. L. Rvachev, G. V. Covma, A. N. Shevchenko]

[Text] Brief characteristics of the problem-oriented language RL-1 and the POLE-SM system for solution of boundary problems of the mathematical physics related to the study, design, and optimization of various physico-mechanical fields are given. The system is based on the ideas of direct methods and the theory of R-functions. Its constructive facilities permit taking into account boundary and geometrical information at the analytical level. The POLE-SM system is used in scientific research and in a training process for solution of application problems of different classes.

**Organization of Data Base and Software of Automated Oceanographic Data Management System**

18630211w Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 99-103

[Synopsis of article by E. A. Alekseenko, A. E. Rogachev, V. E. Rogachev, L. I. Revchina]

[Text] Some aspects of the adopted approach to the data base design, software implementation, and cost estimation of oceanographic data loading into the automated management system are considered. The authors set forth the employed methods of the design of a data base model and give the diagrams of its conceptual model, the architecture of automated oceanographic data management system.

**Capabilities and Implementation of Computer-Aided System of Data Storage and Processing in Physics of Heat**

18630211x Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 103-106

[Synopsis of article by A. I. Blokhin, O. V. Salnikova, M. O. Sudnitsyna]

[Text] Description is given of a computer-aided system of data storage and processing in physics of heat. It enables the user to obtain data in the form of separate files and inverted compilation arrays selected by a thematic criterion. Advantages of the two-level organization of such system due to centralized software are demonstrated.

**Application Program Package of Nonlinear Programming for Solving Problems of Linear, Nonlinear and Stochastic Programming**

18630211y Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 109-112

[Synopsis of article by V. S. Mikhalevich, V. I. Drakin, A. M. Gupal, V. B. Dubrovskij, L. M. Zajceva, V. I. Norkin, and A. S. Stukalo]

[Text] Described is a new application program package for solving large-scale optimization problems. The method of modified Lagrangian functions, the method of reduced gradient, the method of conjugate directions, the stochastic linearization method, the modified simplex-method are implemented in the package. The package is distinguished by developed interaction and interface capabilities.

**Employment of DBMS to Compose Design Documents**

18630211z Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 113-115

[Synopsis of article by V. A. Afanasev]

[Text] A method of computer-assisted composition of the design documents "Specification" and "List of Documents" by means of databases is set forth. Problems of allowance for changes are solved. The most essential features of the offered DBMS are described. The system stood the test when designing a new control computing complex of small computers.

**Main Decisions on Computer-Aided Dispatching Control System at Glavtjumengasprom**

18630211aa Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 115-118

[Synopsis of article by V. K. Novichkov, N. P. Smolin, V. I. Solov'ev]

[Text] Main decisions on the computer-aided dispatching control system at Glavtjumengasprom are listed. They cover the session, representation, and application levels and are central to the design of unified software for the indicated levels of open systems of computer networks.

**Design of Workstations for Decision Makers in Integrated MISs**

18630211bb Kiev UPRAVLYAYUSHCHIYE SISTEMY I MASHINY in Russian No 3, May-Jun 89 pp 118-121

[Synopsis of article by V. N. Antonov]

[Text] Approaches to the design of workstations for decision makers in MISs are described. A special-purpose functional approach to the design of workstations in MISs is suggested. The workstations are rated by an introduced classification and relations between them are revealed. The author gives structural and technological schemes of the workstations with special-purpose functions in the integrated MISs operating at product supplier firms within the system of the State Committee for Material and Technical Supplies of the Ukrainian SSR.



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